## Remarks

The Office Action mailed September 15, 2003 has been received and reviewed. Claims 1-54 having been canceled, claims 55-59 and 66-69 having been amended, and claims 70-79 having been added, the pending claims are claims 55-79.

The specification has been amended at page 12, lines 15-16; page 13, lines 4, 12-14, 16-19, 22-24, and 29 to more clearly describe the Figures, which is supported, for example, by Figures 6, 12, and 14-17. The specification has also been amended at page 36, line 10 to clarify that Applicants are not attempting to recite a hyperlink therein. The specification has been amended at page 48, line 26 to correct a typographical error, the correction of which is supported, for example, by Figure 3. The specification has been amended at page 6, lines 23-24, page 36, line 17, and page 48, line 29 to correctly recite SEQ ID NO:12 as the sequence of the crystallized protein. Support for SEQ ID NO:12 is also specifically recited herein below in the section entitled *Objection to the Sequence Listing*.

Claims 67-68 have been amended to properly recite SEQ ID NO:12, a 189 residue sequence that is supported by the specification at, for example, page 48, lines 28-29 ("189 residues"). Support for SEQ ID NO:12 is also specifically recited herein below in the section entitled *Objection to the Sequence Listing*.

Claims 55-58 have been amended to recite methods for crystallizing *S. aureus* peptide deformylase, wherein the amino acid sequence of the *S. aureus* peptide deformylase comprises SEQ ID NO:12, which is supported, for example, by Table 1 of the specification. Claims 59 and 66-69 have been amended to recite that the crystalline *S. aureus* peptide deformylase or the crystal effectively diffracts x-rays to a resolution of 10 Å to 1.9 Å, which is supported by the specification at, for example, page 60, line 23 ("data from 10 to 1.9 Å resolution").

New independent claim 70 recites a polypeptide that is supported, for example, by originally filed claim 1, now canceled (e.g., "active site comprising amino acids Gly58 . . . and His158"). New claim 71 is supported, for example, by originally filed claim 1 (now canceled). New claim 72 is supported, for example, by Table 1 and originally filed claim 10 (now

canceled). New claims 73-74 are supported, for example, by originally filed claims 2 and 3 (now canceled).

New independent claim 75 recites a polypeptide that is supported, for example, by orignally filed claim 4, now canceled (e.g., "active site comprising amino acids Arg56 . . . and His158"). New claim 76 is supported, for example, by originally filed claim 4 (now canceled). New claim 77 is supported, for example, by Table 1 and originally filed claim 10 (now canceled). New claims 78-79 are supported, for example, by originally filed claims 5 and 6 (now canceled).

Reconsideration and withdrawal of the rejections are respectfully requested.

**Affirmation of Provisional Election**

The Examiner issued a Restriction Requirement under 35 U.S.C. 121 in the above-identified application, grouping the claims as follows: Group I, claims 1-8 and 55-69, drawn to a molecule or molecular complex comprising at least a portion of *S. aureus* peptide deformylase, crystal thereof, and a method making crystal; Group II, claims 9-15, drawn to scalable three-dimensional configuration of point, presumably, a structure defined by the atomic coordinates in Table 1; Group III, claims 16 and 17, drawn to a machine-readable data storage medium; Group IV, claim 18, drawn to a method of obtaining structure; Group V, claim 19, drawn to a method of homology modeling; Group VI, claims 20-48, drawn to a method of identifying potential modifier of *S. aureus* peptide deformylase; Group VII, claims 49-51, drawn to a method of making potential modifier of *S. aureus* peptide deformylase; and Group VIII, claims 52-54, drawn to a composition comprising a modifier of *S. aureus* peptide deformylase activity. Applicants hereby affirm, without traverse, the provisional election to prosecute claims 1-8 and 55-69, Group I, made in response to a telephone conversation with the Examiner on July 10, 2003.

**Objection to the Sequence Listing**

The Examiner stated that the present application fails to comply with the requirements of 37 C.F.R. §1.821 through 1.825 for the reason(s) set forth on the "attached Notice To Comply With Requirements For Patent Applications Containing Nucleotide Sequence And/Or Amino Acid Sequence Disclosures" (page 4 of the Office Action mailed September 15, 2003). Applicants respectfully traverse the objection.

*First, a* Notice To Comply With Requirements For Patent Applications Containing Nucleotide Sequence And/Or Amino Acid Sequence Disclosures was not attached to the Office Action mailed September 15, 2003.

*Second*, Applicants respectfully submit that the present application is in compliance with the requirements for patent applications containing nucleotide sequence and/or amino acid sequence disclosures. A sequence listing, believed to be in compliance with the requirements of 37 C.F.R. §1.821 through 1.825, was submitted by Applicants on October 31, 2001.

Nonetheless, the Examiner asserted that "the amino acid sequence contained in Table 1 is not part of the sequence listing or the computer readable form (CRF), and not identified in the specification with a sequence identification number" (page 4 of the Office Action mailed September 15, 2003). Applicants respectfully disagree. Applicants note that Table 1 "lists the atomic structure coordinates for molecule *Staphylococcus aureus* peptide deformylase (*S. aureus* pdf) as derived by x ray diffraction from a crystal of the protein" (page 9, lines 26-28 of the specification). Thus, the structure coordinates represent the spatial positions of atoms identified in the crystal structure. Notably, identified atoms include some of the atoms of amino acid residues 25-208 of SEQ ID NO:1. However, Table 1 also includes other atoms identified in the crystal structure (e.g., water molecules). Applicants respectfully submit that Table 1 does not represent an "amino acid sequence" as defined in 37 C.F.R. §1.821 ("an unbranched sequence of four or more amino acids"), and thus, a sequence listing for Table 1 is not required.

The Examiner further noted that "the specification and the claims contain many references to specific amino acid residues presumably from a specific amino acid sequence without identifying the amino acid sequence with a sequence identification number" (page 4 of the Office Action mailed September 15, 2003). Applicants respectfully disagree. For example, claim 1 recites an "active site comprising amino acids Gly58, Gly60, Leu61, Gln65, Glu109 , Gly110, Cys111, Leu112, Ile150, His154, Glu155, and His158," and refers to "structure coordinates listed in Table 1." Thus, the numbering of the recited amino acids refers to the numbering of the amino acids in the structure coordinates listed in Table 1, not to a specific amino acid sequence. Thus, Applicants respectfully submit that sequence listings are not required.

Nonetheless, to provide further clarification, Applicants are submitting herewith an Amended Sequence Listing, in which SEQ ID NO:12 has been added. SEQ ID NO:12 is supported, for example, by SEQ ID NO:1 and Table 1. Specifically, SEQ ID NO:12 is a 189 residue amino acid sequence corresponding to residues 25 to 213 of SEQ ID NO:1. Notably, the numbering of the residues in SEQ ID NO:12 corresponds to the numbering of the amino acid residues identified in Table 1.

Based on the remarks presented herein above, Applicants respectfully request that the objection to the Sequence Listings be reconsidered and withdrawn.

**Objection to Drawings**

The Examiner objected to the drawings for allegedly being of low quality and containing informalities. Applicants note that the Examiner has not acknowledged receipt of the Formal Drawings submitted by Applicants on August 19, 2002. Applicants respectfully request that the Examiner acknowledge and consider the Formal Drawings submitted by Applicants. In the event that the Formal Drawings have been misplaced, Applicants will resubmit the Formal Drawings upon notification to that effect.

Applicants believe that the Formal Drawings submitted on August 19, 2002, are of acceptable quality, and respectfully request that the Examiner specifically note any formalities

therein. Applicants have also amended, herein, the *Brief Description of the Figures* in the specification, to more clearly describe the figures.

**Objection to the Specification**

The Examiner objected to the specification for the following informalities.

*First*, the Examiner noted that the specification recites "C-terminal 6xHis tag (SEQ ID NO: 1)" (e.g., page 12, line 3), but alleged that the C-terminus of SEQ ID NO:1 does not include six His residues. Applicants note that the specification, in describing Figure 3, at page 12, line 10 (as amended in the Preliminary Amendment submitted by Applicants on January 11, 2002) states that "[t]he boxed amino acids show mutations for *S. aureus* pdf (SEQ ID NO:1)." Figure 3 clearly shows that the "Q" in the C-terminal "HQHHHH" of SEQ ID NO:1 is a mutation in the C-terminal 6xHis tag. Further, the specification further states that the "cDNA clone used for protein expression and purification (R127K H186Q, highlighted in Figure 3) contained two mutations. The second mutation is confirmed to be in the HIS6 tag (near the c-terminus) and has no effect on Km or Kcat. The gene encodes a total of 189 residues including a c-terminal hexahis tag" (page 48, lines 25-29). Thus, Applicants respectfully submit that the description of SEQ ID NO:1 as having a C-terminal 6xHis tag would be clear to one of skill in the art when read in view of the specification.

*Second*, the Examiner also objected to the specification for allegedly containing an embedded hyperlink at page 36, line 10. The specification having been amended at page 36, line 10, Applicants respectfully submit that the objection has been rendered moot.

Based on the remarks presented herein above, Applicants respectfully request that the objections to the specification be reconsidered and withdrawn.

**Rejection under 35 U.S.C. §112, Second Paragraph**

The Examiner rejected claims 1-8 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which

Applicants regard as the invention. Claims 1-8 having been canceled, the rejection is rendered moot.

Applicants respectfully request that the Examiner reconsider and withdraw the rejections under 35 U.S.C. §112, second paragraph.

**Rejection under 35 U.S.C. §112, First Paragraph**

*WRITTEN DESCRIPTION*

The Examiner rejected claims 1-8 and 55-69 under 35 U.S.C. §112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 1-8 have been canceled. Applicants respectfully traverse the rejection of claims 55-69.

"To satisfy the written description requirement, a patent specification must describe the claimed invention in sufficient detail that one skilled in the art can reasonably conclude that the inventor had possession of the claimed invention." M.P.E.P. §2163. Factors to be considered in determining whether there is sufficient evidence of possession include the level of skill and knowledge in the art, partial structure, physical and/or chemical properties, functional characteristics alone or coupled with a known or disclosed correlation between structure and function, and the method of making the claimed invention.

Claims 55-58 (as amended) are directed to methods for crystallizing *S. aureus* peptide deformylase; claim 59 (as amended) is directed to crystalline *S. aureus* peptide deformylase; and claims 60-69 (as amended) are directed to crystals of *S. aureus* peptide deformylase.

Applicants respectfully submit that the specification (including, for example, the originally filed claims) provides an adequate written description for methods for crystallizing *S. aureus* peptide deformylase. For example, method claims 55-58 (as amended) recite that the amino acid sequence of the *S. aureus* peptide deformylase comprises SEQ ID NO:12, along with appropriate crystallization conditions including, for example, concentration of the *S. aureus*

peptide deformylase and composition of the precipitating solution: e.g., pH (e.g., claims 55-58), composition and % by weight PEG (e.g., claims 55, 56, and 58), molarity of citric acid (e.g., claim 56), sodium citrate (e.g., claim 57), and buffer (e.g., claim 57). Thus, Applicants respectfully submit that the specification, which includes the originally filed claims, adequately supports methods for crystallizing *S. aureus* peptide deformylase (e.g., claims 55-58).

Further, Applicants respectfully submit that the specification (including, for example, the originally filed claims) provides an adequate written description for crystalline *S. aureus* peptide deformylase (e.g., claim 59, as amended), and crystals of *S. aureus* peptide deformylase (e.g., claims 60-69, as amended). The crystal claims recite various parameters including, for example, space group symmetry (e.g., claims 60, 62-64, as amended), unit cell dimensions (e.g., claims 61-64, as amended), coordinated ions (e.g., claim 69), structure coordinates (e.g., claim 65), molecules in the asymmetric unit (e.g., claim 66, as amended), amino acid sequence (e.g., claims 67-68, as amended), and effective diffraction of x-rays to a resolution of 10 Å to 1.9 Å (e.g., claims 59, and 66-69, as amended). Thus, Applicants respectfully submit that the specification adequately supports crystals of *S. aureus* peptide deformylase (e.g., claims 54-76).

Moreover, in Trilateral Project WM4 on *Comparative study on "protein 3-dimensional (3-D) structure related claims*, in referring to a hypothetical claim (i.e., "A crystalline form of protein P having unit cell dimensions of a=4.0nm, b=7.8nm, and c=11.0nm") stated that "[t]he claim complies with the written description requirement because the structure of protein P is provided." Trilateral Project WM4 on *Comparative study on "protein 3-dimensional (3-D) structure related claims*, Annex 3, Case 4, A3 (http://www.uspto.gov/web/tws/wm4/pdf/wm4_3d_annex_3.pdf). Applicants respectfully submit that the present specification provides the structure of *S. aureus* peptide deformylase. *See, for example*, the atomic structure coordinates listed in Table 1, and described, for example, at page 9, line 26 to page 10, line 10 of the specification.

Based on the remarks presented herein above, Applicants respectfully submit that the specification recites structural, physical, and chemical properties, along with a method of

making the claimed invention, sufficient to satisfy the written description requirement under 35 U.S.C. §112, first paragraph.

*ENABLEMENT*

The Examiner rejected claims 1-8 and 55-69 under 35 U.S.C. §112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claims 1-8 have been canceled. Applicants respectfully traverse the rejection of claims 55-69.

"A specification disclosure which contains a teaching of the manner and process of making and using an invention in terms which correspond in scope to those used in describing and defining the subject matter sought to be patented must be taken as being in compliance with the enablement requirement of 35 U.S.C. 112, first paragraph, unless there is a reason to doubt the objective truth of the statements contained therein which must be relied on for enabling support." M.P.E.P. §2164.04. "As long as the specification discloses at least one method for making and using the claimed invention that bears a reasonable correlation to the entire scope of the claim, then the enablement requirement of 35 U.S.C. 112 is satisfied." M.P.E.P. §2164.01(b). "For a claimed genus, representative examples together with a statement applicable to the genus as a whole will ordinarily be sufficient if one skilled in the art (in view of level of skill, state of the art and the information in the specification) would expect the claimed genus could be *used* in that manner without undue experimentation. Proof of enablement will be required for other members of the claimed genus only where adequate reasons are advanced by the examiner to establish that a person skilled in the art could not *use* the genus as a whole without undue experimentation." M.P.E.P. §2164.02, paragraph entitled "WORKING EXAMPLES AND A CLAIMED GENUS" (emphasis added). "[E]ven in unpredictable arts, a disclosure of every operable species is not required." M.P.E.P. §2164.03.

Applicants further submit that claims 55-69 are fully enabled by the specification. Although not required, the specification includes working examples of methods for crystallizing

*S. aureus* peptide deformylase (e.g., page 51, line 13 to page 55, line 17). The specification also provides methods of using the claimed crystals (e.g., homology modeling and rational drug design, page 40, line 15 to page 47, line 15). Moreover, the Examiner has not provided any reason to doubt the objective truth of the disclosure provided in the specification.

Moreover, Applicants respectfully submit that one of skill in the art, using the disclosure provided in the specification (including the working examples), would be able to make and use the entire scope of the invention as recited in claims 55-69. For example, Applicants' Representatives respectfully submit that the present disclosure of methods of making and using crystals of *S. aureus* peptide deformylase provides enablement for one of skill in the art, without undue experimentation, to make additional crystals of *S. aureus* peptide deformylase. For example, Applicants' Representatives respectfully submit that the presently disclosed crystals provide enablement for one of skill in the art to use the crystals in, for example, cross-seeding techniques (*see* the specification at, for example, page 51, line 13 to page 55, line 17, for disclosure of micro-seeding) to make additional crystals of *S. aureus* peptide deformylase. Thus, Applicants respectfully submit that claims 55-69 (as amended) are fully enabled by the specification.

Based on the remarks presented herein above, Applicants respectfully request that the Examiner reconsider and withdraw the rejections under 35 U.S.C. §112, first paragraph.

**Rejection under 35 U.S.C. §102**

The Examiner rejected claims 1-8 under 35 U.S.C. §102(b) or (e) as being anticipated by Lonetto et al. (U.S. Patent No. 6,410,688 or EP 879979 A2). Claims 1-8 having been canceled, the rejection has been rendered moot.

Applicants respectfully request that the Examiner withdraw the rejection under 35 U.S.C. §102.

**New Claims**

New claims 70-79 are directed to polypeptides consisting of a portion of *S. aureus* peptide deformylase. Entry and consideration of new claims 70-79 are respectfully requested.

**Information Disclosure Statement**

The Examiner indicated that the documents submitted with the Information Disclosure Statement on December 6, 2001 have been lost in the patent office. As a courtesy, Applicants are submitting herewith duplicate copies of each of the documents listed on the 1449 forms. Consideration of each of the documents is respectfully requested. Pursuant to the provisions of M.P.E.P. §609, Applicants further request that a copy of the 1449 form(s), marked as being considered and initialed by the Examiner, be returned with the next Official Communication.

Applicants further request that the documents listed on the 1449 form (EXHIBIT A) submitted with the Information Disclosure Statement on July 22, 2002 also be considered by the Examiner. Again, pursuant to the provisions of M.P.E.P. §609, Applicants further request that a copy of the 1449 form (EXHIBIT A), marked as being considered and initialed by the Examiner, be returned with the next Official Communication.

## Summary

It is respectfully submitted that all the pending claims are in condition for allowance and notification to that effect is respectfully requested. The Examiner is invited to contact Applicants' Representatives, at the below-listed telephone number, if it is believed that prosecution of this application may be assisted thereby.

Respectfully submitted for
**Baldwin et al.**

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CERTIFICATE UNDER 37 CFR §1.10:
"Express Mail" mailing label number: **EV 405459094 US** Date of Deposit: **MARCH 15, 2004**
The undersigned hereby certifies that the Transmittal Letter and the paper(s) and/or fee(s), as described hereinabove, are being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR §1.10 on the date indicated above and is addressed to the Commissioner for Patents, Mail Stop Sequence, P.O. Box 1450, Alexandria, VA 22313-1450.

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